

REMARKS

The present invention relates to catalysts for copolymerization of olefins and styrenes, and to methods for producing olefin-styrene copolymers. Particularly it relates to catalysts for olefin-styrene copolymerization comprising, as one component, a specific compound, and to inexpensive and efficient methods for producing olefin-styrene copolymers with the catalysts.

As described in the specification under "Background Art", beginning at page 1, second paragraph, metallocene catalysts, used for olefinic polymer production, in order to exhibit satisfactory activity, require large amounts of promoters such as aluminoxanes and the like, which result in relatively high total catalyst costs and promoter-caused catalyst residue often remaining in the polymers thereby unfavorably coloring them. Various prior art has tried to address these problems, which prior art has not been satisfactory. The present invention successfully addresses these problems. As recited in above-amended Claim 1, the catalyst of the present invention comprises the above-recited components (A), (B), (C), and optionally (D). Note that component (C) is now limited to a compound having the moiety $((\text{phenyl})_3\text{-X-Y})_n$.

The rejections of Claims 1, 3, 4, 7-11 and 13-14 under:

35 U.S.C. § 102(b) as anticipated by any of U.S. 5,786,432 (Küber et al '432) and WO98/01485A1 (Starzewski et al '485), and

35 U.S.C. § 102(e) as anticipated by any of U.S. 6,271,313 (Zambelli et al); U.S. 6,242,544 (Küber et al '544); and U.S. 6,191,241 (Starzewski et al '241),

are respectfully traversed.

Küber et al '432 discloses a particular metallocene catalyst for a catalyst system for the polymerization or copolymerization of olefins, which system also includes a cocatalyst, preferably an aluminoxane or a supported aluminoxane.

Zambelli et al discloses the formation of styrene-butadiene block copolymers having a particular structure using certain catalyst systems when the polymerization is conducted at a particular 1, 3-butadiene partial pressure and within a particular temperature range (paragraph bridging columns 13 and 14). The catalyst system comprises a catalyst component and a co-catalyst component, as described in the specification at column 14, line 31 through column 15, line 37.

Küber et al '544 discloses a catalyst system for polymerization or copolymerization of olefins comprising a co-catalyst, preferably an aluminoxane or a supported aluminoxane, and a particular metallocene.

Starzewski et al '485 and its equivalent Starzewski et al '241 disclose that high-melting polyolefins can be prepared using particular metallocene compounds.

None of the above-applied prior art discloses or otherwise suggests the presently-recited compound of general formula (1) of component (C). Clearly, none of the particular passages the Examiner has cited to in any of the applied prior art discloses such a compound. If the Examiner continues to reject over any of the above-applied prior art, the Examiner is respectfully requested to specifically point out which disclosure is being relied upon. The present "Response to Arguments" beginning at page 8 of the Office Action fails to do so. In other words, the Examiner cannot simply state that "Applicants arguments were not persuasive and the rejection stands."

For all the above reasons, it is respectfully requested that these rejections be withdrawn.

The rejections of Claims 1, 3, 4, 7-11 and 13-14 under the judicially created doctrine of obviousness-type double patenting over Claims 1-19 of U.S. 6,107,232 (Yokota), or over Claims 1 and 9-12 of U.S. 6,255,244 (Yabunouchi), are respectfully traversed.

Yokota claims a polymerization catalyst comprising a particular transition metal compound (A) and an activation cocatalyst (B), such as an aluminoxane or a Lewis acid, and optionally, as claimed in Claim 7, an organic aluminum compound (C). Yabunouchi claims a catalyst for polymerization of olefins or styrenes, which is prepared by contacting (A) a transition metal compound, (B) at least one material selected from the group consisting of oxygen-containing compounds and compounds which react with a transition metal compound to form an ionic complex, and optionally (C) an alkylating agent with each other, and contacting these materials (A), (B) and (C) with an adsorbing substance (D), during or after the contact of materials (A), (B) and (C) with each other, followed by removing the adsorbing substance (D) from the contacted materials (A), (B) and (C).

None of the claims of Yokota or Yabunouchi recite the presently-recited compound of general formula (1) of component (C). While this in and of itself is sufficient to overcome the rejections, note that a compound of said general formula (1) is not even disclosed in Yokota or Yabunouchi. Again, as argued above with regard to the rejections over prior art, if the Examiner persists that presently-recited component (C) is recited in any of the claims of Yokota or Yabunouchi, the Examiner is respectfully requested to identify specifically what language in the claims is being relied upon.

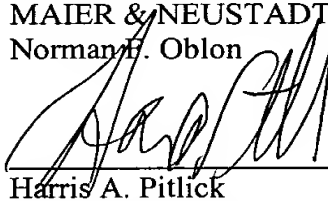
For all the above reasons, it is respectfully requested that these rejections be withdrawn.

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Reply to Office Action of January 21, 2004

All of the presently pending and active claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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